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CLAIMS

[Claim(s)]

[Claim 1]In a digital camera which records image data which picturized a photographic subject, was provided with an imaging means which outputs image data showing an object image, and was outputted from the above-mentioned imaging means on a recording medium, By an image pick-up conditioning means and the above-mentioned image pick-up conditioning means of setting up image pick-up conditions. By an image pick-up condition memory measure and the above-mentioned image pick-up condition memory measure which memorize set-up image pick-up conditions. A digital camera provided with an image pick-up condition selecting means which chooses image pick-up conditions from image pick-up conditions memorized, and an imaging control means which controls the above-mentioned imaging means to picturize a photographic subject based on image pick-up conditions with the above-mentioned selected image pick-up condition selecting means.

[Claim 2]Have further a name input means which inputs a name which identifies image pick-up conditions set up by the above-mentioned image pick-up conditioning means, and the above-mentioned image pick-up condition memory measure, The digital camera according to claim 1 further provided with a display which displays a name which relates image pick-up conditions set up by the above-mentioned image pick-up conditioning means with a name into which it was inputted from the above-mentioned name input means, memorizes them, and is memorized by the above-mentioned image pick-up condition memory measure.

[Claim 3]The digital camera according to claim 1 further provided with a storage control means which makes the above-mentioned image pick-up condition memory measure memorize image pick-up conditions set as a digital camera by having been considered as power OFF by electric power switch which turns off a power supply of a digital camera, and the above-mentioned electric power switch.

[Claim 4]The digital camera according to claim 1 in which initial image pick-up conditions are set as the above-mentioned image pick-up condition memory measure.

[Claim 5]In a digital camera which records image data which picturized a photographic subject, was provided with an imaging means which outputs image data showing an object image, and was outputted from the above-mentioned imaging means on a

recording medium, A motion controlling method of a digital camera which controls the above-mentioned imaging means to set up image pick-up conditions, to memorize set-up image pick-up conditions, to choose image pick-up conditions from image pick-up conditions memorized, and to picturize a photographic subject based on selected image pick-up conditions.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to a digital camera (what gave the function of the digital camera to a digital still camera, a digital movie camera, and portable information machines and equipment is included), and a motion controlling method for the same.

[0002]

[Background of the Invention]A user can set up image pick-up conditions (recording condition) as a digital camera has advanced features. On image pick-up conditions, for example A picture quality mode (compression ratio), image size (pixel number), Sharpness intensity, AWB (automatic white balance) mode (a standard, daytime, a fluorescent lamp, an incandescent lamp, a tungsten lamp, etc.), Varieties, such as AE (automatic exposure) modes (a standard, a night view, etc.), a color gain (chroma saturation), contrast, strobe light mode, strobe light intensity, and a zoom position, are covered. There are many kinds of image pick-up conditions which a user can set up as the digital camera of a high-class model.

[0003]If a user can set up image pick-up conditions, whenever it picturizes, the image pick-up condition must be set up. Since it will be eliminated by setting up new image pick-up conditions, even if the image pick-up conditions set up once are the cases where it is going to picturize on the same image pick-up conditions as the image pick-up conditions set up before, they must reset up image pick-up conditions again. Thus, setting out of image pick-up conditions is dramatically troublesome for a user.

[0004]

[Description of the Invention]An object of this invention is to make it end, even if it does

not reset up image pick-up conditions again, when picturizing on the same image pick-up conditions as the image pick-up conditions set up before.

[0005]In the digital camera which records the image data which this invention picturized the photographic subject, was provided with the imaging means which outputs the image data showing an object image, and was outputted from the above-mentioned imaging means on a recording medium, By the image pick-up conditioning means and the above-mentioned image pick-up conditioning means of setting up image pick-up conditions. By the image pick-up condition memory measure and the above-mentioned image pick-up condition memory measure which memorize the set-up image pick-up conditions. It has the image pick-up condition selecting means which chooses image pick-up conditions from the image pick-up conditions memorized, and the imaging control means which controls the above-mentioned imaging means to picturize a photographic subject based on image pick-up conditions with the above-mentioned selected image pick-up condition selecting means.

[0006]This invention also provides the method suitable for the above-mentioned camera. Namely, in the digital camera which records the image data which this method picturized the photographic subject, was provided with the imaging means which outputs the image data showing an object image, and was outputted from the above-mentioned imaging means on a recording medium, The above-mentioned imaging means is controlled to set up image pick-up conditions, to memorize the set-up image pick-up conditions, to choose image pick-up conditions from the image pick-up conditions memorized, and to picturize a photographic subject based on the selected image pick-up conditions.

[0007]If image pick-up conditions are set up according to this invention, that set-up image pick-up condition will be memorized. The image pick-up conditions which a user wants to use are chosen from the image pick-up conditions memorized. Selection of image pick-up conditions will control the above-mentioned imaging means to picturize a photographic subject based on the selected image pick-up conditions.

[0008]Since the set-up image pick-up conditions are memorized, desired image pick-up conditions can be set up only by choosing image pick-up conditions to use out of the image pick-up condition memorized. The same image pick-up conditions as before can be set up only by choosing image pick-up conditions, without a user resetting up again, even if it is the image pick-up conditions used before.

[0009]It is good to have further a name input means which inputs the name which identifies the image pick-up conditions set up by the above-mentioned image pick-up conditioning means. In this case, I will relate the image pick-up conditions set up by the above-mentioned image pick-up conditioning means with the name into which it was inputted from the above-mentioned name input means, and the above-mentioned image pick-up condition memory measure will memorize them. It has further a display which displays the name memorized by the above-mentioned image pick-up condition memory measure.

[0010]By inputting the name with which image pick-up conditions are expressed appropriately, by seeing the name shows the contents of the image pick-up conditions. A name is referred to and selection of image pick-up conditions becomes comparatively easy. For example, when two or more users use it, the image pick-up conditions which the user uses can be chosen only by seeing a user name by relating with the name of the user name and memorizing image pick-up conditions.

[0011]It may have further a storage control means which makes the above-mentioned image pick-up condition memory measure memorize the image pick-up conditions set as the digital camera by having been considered as power OFF by the electric power switch which turns off the power supply of a digital camera, and the above-mentioned electric power switch.

[0012]When a power supply can make the image pick-up conditions in the state where it was set to OFF memorize and uses it for the next, it can picturize according to the image pick-up condition.

[0013]Initial image pick-up conditions may be set as the above-mentioned image pick-up condition memory measure.

[0014]For example, image pick-up conditions can be set up only by choosing the initial image pick-up condition, without a user setting up image pick-up conditions by setting up image pick-up conditions comparatively frequently-used as initial image pick-up conditions.

[0015]

[Example]Drawing 1 is the perspective view which shows the example of this invention and looked at the digital still camera 1 from the back.

[0016]In the upper surface of the digital still camera 1, the shutter release button 2 is formed in right-hand side. The mode setting dial 3 is formed before this shutter release button 2, enabling free rotation. The arrow 4 is formed in the left-hand side of the mode setting dial 3.

[0017]The liquid crystal display screen 10 is formed in the back of the digital still camera 1 almost over the whole surface. An object image, a reproduced image, etc. which were picturized to this liquid crystal display screen 10 are displayed. If the mode set up and the mode set up are reproduction modes, the frame number and image quality (fine , Normal or economy) will be displayed on the upper part of the liquid crystal display screen 10.

[0018]The electric power switch 5 for one [a power supply] and turning off the power supply of the digital still camera 1 is formed in the upper part of the liquid crystal display screen 10.

[0019]The upper button 6, the bottom button 7, the left button 8, and the right button 9 are formed in the right-hand side of the liquid crystal display screen 10. The Cancel button 14 for giving the LOAD button 13 for giving the SAVE button 12 for giving save instructions of the SET button 11 and an imaging parameter and load instructions of an imaging parameter and cancellation instructions is formed in the right-hand side of the liquid crystal display screen 10.

[0020]Drawing 2 shows the mode setting dial 3 and the arrow 4.

[0021]At the mode setting dial 3, each character of Online, Cam, Play, and Setup is indicated.

[0022]Online mode is set up by rotating the mode setting dial 3 so that the character of Online may be located in the arrow 4. Communication of the digital still camera 1 and a personal computer is attained with Online mode. Cam mode is set up by rotating the mode setting dial 3 so that the character of Cam may be located in the arrow 4. It becomes recordable [the image data which expresses an image pick-up and object image of a photographic subject with Cam mode]. By rotating the mode setting diamond 3 so that the character of Play may be located in the arrow 4, image restoration becomes possible. Setup mode is set up by rotating the mode setting dial 3 so that the character of

Setup may be located in the arrow 4. An imaging parameter can be set up now with Setup mode mention later.

[0023]Drawing 3 is a block diagram showing the electric constitution of the digital still camera 1.

[0024]Operation of the whole digital still camera 1 is generalized by CPU20.

[0025]The digital still camera 1 can set up an imaging parameter mention later, and can memorize the set-up imaging parameter as a Profile table. This Profile table is memorized by the nonvolatile memory 32. The system memory 31, and the calendar/clock 33 which memorizes the operation program of the digital still camera 1 whole, etc. is contained in the digital still camera 1.

[0026]The signal which shows setting out of the various buttons (35, such as a switch) etc. which were mentioned above is inputted into the digital still camera 1 via the I/O (input/output) unit 34. The digital still camera 1 has a function of speed light photography, and the strobe control circuit 38 which controls the strobe light device 39 and the strobe light device 39 is included.

[0027]Imaging optical systems, such as solid electronic image sensors, such as CCD, a zoom lens, and a diaphragm, are included in the image pick-up circuit 21. A photographic subject will be picturized by the image pick-up circuit 21 if Cam mode is set up by the mode setting dial 4. By picturizing a photographic subject, the video signal showing an object image is outputted from the image pick-up circuit 21. In the digital disposal circuit 22, as for the video signal showing an object image, signal processing, such as white balance adjustment, sharpness adjustment, saturation adjustment, and contrast adjustment, is performed.

[0028]The outputted video signal is changed into digital image data in the analog-to-digital conversion circuit 23 from the digital disposal circuit 22. In the digital to analog circuit 29, the changed digital image data is again returned to an analog video signal via the frame memory 27. The signal from OSD(onscreen device) 28 is also given to the digital to analog circuit 29.

[0029]By giving the video signal outputted from the digital to analog circuit 29 to the liquid crystal display 30, as shown in drawing 1, the object image which the character in the Cam mode obtained by the image pick-up piled up will be displayed on the liquid crystal display screen 10.

[0030]The connector 26 is also formed in the digital still camera 1. A personal computer is connectable with this connector 26. By giving the image data showing an object image to the connector 26 via the communication interface 25, image data will be transmitted to the personal computer connected to the connector 26.

[0031]When Cam mode is set up, in compression / extension circuit 24, the data compression of the image data outputted from the analog-to-digital conversion circuit 23 when the shutter release button 2 was pushed is carried out. The image data by which the data compression was carried out is recorded on the memory card 40 with which the memory card slot 37 is equipped via the card interface 36.

[0032]If Play mode is set up by the mode setting dial 4, the compressed image data currently recorded on the memory card 40 will be read. In compression / extension circuit 24, data extension of the read compressed image data is carried out. An object image will be displayed on the display screen 10 by giving the image data by which data extension was carried out to the liquid crystal display 30 via the frame memory 27 and the digital to

analog circuit 29.

[0033]Drawing 4 is an example of the Profile table memorized by the nonvolatile memory 32.

[0034]The name is set to the Profile table for every Profile, and the imaging parameter of Profile specified by that Profile number can be read to it for every image pick-up conditions by referring to this name and specifying a Profile number. There are image quality (compression ratio), resolution, sharpness, AWB mode, AE mode, chroma saturation, contrast, a strobe mode, a stroboscope level, etc. in image pick-up conditions.

[0035]In the Profile table, the imaging parameter of the image pick-up conditions by which initial setting is carried out is also memorized. The imaging parameter by which initial setting is carried out is a parameter with high normal use frequency, and is specified in the name of DEFAULT (Profile0). The imaging parameter by which initial setting is carried out does not make a user change. The imaging parameter (Current Profile) set up when the power supply of the digital still camera 1 was turned off by the Profile table is also memorized, and if one [a power supply], the imaging parameter of Current Profile will be read.

[0036]Drawing 5 to drawing 8 is a flow chart which shows the procedure of a digital still camera. Drawing 12 shows an example of the picture displayed on the liquid crystal display screen 10 from drawing 9.

[0037]When one [with the electric power switch 5 / the power supply of the digital still camera 1], the imaging parameter of Current Profile in the Profile table memorized by the nonvolatile memory 32 is loaded. The diaphragm value of the image pick-up circuit 21, the amount of adjustments of the white balance adjustment of the digital disposal circuit 22, the grade of sharpness, the compression ratio of compression / extension circuit 24, etc. are set up become the loaded imaging parameter (Step 51). After purchasing the digital still camera 1, in using it for the first time, There is no Current Profile in a Profile table, and by Profile0 by which initial setting is carried out. Since only the imaging parameter specified is memorized, it cannot be overemphasized that each circuit of the digital still camera 1 is set up according to the imaging parameter specified by Profile0.

[0038]The mode setting dial 3 is turned by the user and the mode is chosen (Step 52).

[0039]Setting out of Setup mode will display a Setup picture on the liquid crystal display screen 10, as shown in drawing 9 (Step 53). The imaging parameter of Current Profile is displayed on the Setup picture just behind a power turn. Each of next fields are included in the Setup picture.

[0040]Image pick-up condition viewing area 110; it is a field which displays the image pick-up conditions which can be set up by a user. There are image quality, resolution, sharpness, AWB mode, AE mode, etc. Compared with other image pick-up conditions, the light is brightly switched on so that a user may understand being chosen about the image pick-up conditions chosen among each of these photographing conditions (in drawing 12, the inverse video is carried out from drawing 9). By pushing the upper button 6 of the digital still camera 1 once, that the image pick-up conditions on one of the image pick-up conditions chosen now are chosen, a next door, and the image pick-up conditions on one light up. By pushing the bottom button 7 of the digital still camera 1 once, the image pick-up conditions under one of the image pick-up conditions chosen now will be chosen, and the image pick-up conditions under one light up.

[0041]Imaging parameter viewing area 111; according to image pick-up conditions, the imaging parameter which can be set up is displayed corresponding to image pick-up conditions. The imaging parameter set as Current Profile is displayed. The imaging parameter set up is on and the established state can be checked. By pushing the left button 8, the imaging parameter on the left-hand side of the imaging parameter chosen now will be chosen, and the imaging parameter on the right-hand side of the imaging parameter chosen now will be chosen by pushing the right button 9.

[0042]If an imaging parameter is image quality, fine (it is high-definition, and when setting up a compression ratio low, chosen), Normal (it is standard image quality, and when setting it as the usual compression ratio, chosen), or an economy (it is low image quality, and when setting up a compression ratio highly, chosen) can be set up. If it is resolution, 960 pixels of 1280 pixels of horizontal direction perpendicular directions, 768 pixels of 1024 pixels of horizontal direction perpendicular directions, or 480 pixels of 640 pixels of horizontal direction perpendicular directions can be set up. If it is sharpness, it can set up from the grade of standard sharpness to plus and the minus 1 or 2. If it is in AWB mode, a fluorescent lamp (floor line) etc. can be set up a standard (STD) and in the daytime (D/L). If it is in AE mode, there are a standard (STD), an object for night views (Slow sync), etc. If it is contrast, it can set up from the grade of standard contrast to plus and the minus 1 or 2.

[0043]SAVE instruction viewing area 112; if the set-up imaging parameter may be sufficient, the character to which the depression of the SAVE button 12 is urged is displayed.

[0044]LOAD instruction viewing area 113; when an imaging parameter is loaded so that it may mention later, the character to which the depression of the LOAD button 13 is urged is displayed.

[0045]If the upper button 6 or the bottom button 7 is pushed as mentioned above (it is YES at Step 54), the image pick-up conditions chosen according to the depression will change (Step 55). A push on the left button 8 or the right button 9 will change the imaging parameter chosen according to the depression (Step 57). (it is YES at Step 56)

[0046]As mentioned above, when the SAVE button 12 is pushed (Step 58), the set-up imaging parameter is saved to a Profile table as new Profile (Step 59). (Profile save operation) This Profile save operation is mentioned later in detail. As mentioned above, when the LOAD button 13 is pushed (Step 60), the imaging parameter of selected Profile is loaded from a Profile table (Step 61). (Profile loading operation) This Profile loading operation is also mentioned later in detail.

[0047]If the power supply of the digital still camera 1 is not turned off by the electric power switch 5 (it is NO at Step 62), unless the mode is changed by the mode setting dial 3, processing of Steps 53-61 is repeated (Step 63).

[0048]If the power supply of the digital still camera 1 is turned off by the electric power switch 5 (it is YES at Step 62), the imaging parameter of the actual condition set up will be overwritten by Current Profile (Step 64). Next, when one [the power supply of the digital still camera 1], it is automatically set as the state of the imaging parameter set up at the end.

[0049]If the mode in which the set-up mode was changed or (it is YES at Step 63) set up is except Setup mode (Step 52), it will become processing in the mode changed or set up.

[0050]Setting out of Cam mode will perform imaging operation of a photographic subject

(Step 71). A power supply is not turned off like Setup mode (it is NO at Step 72), and imaging operation is continued unless a mode change is carried out (it is NO at Step 73). YES) and the imaging parameter set up now are overwritten by Current Profile at the (step 72 by turning off a power supply (Step 64).

[0051]Setting out of Play mode will perform reproduction motion of the image data currently recorded on the memory card 40 with which the digital still camera 1 is loaded (Step 74). Imaging operation is continued unless the mode change of the power supply is turned off and (it is NO at Step 75) carried out like Setup mode also in Play mode (it is NO at Step 76). YES) and the imaging parameter set up now are overwritten by Current Profile at the (step 75 by turning off a power supply (Step 64).

[0052]Setting out of Online mode will perform connecting operation with the personal computer connected to the connector 26 of the digital still camera 1 (Step 77). Imaging operation is continued unless the mode change of the power supply is turned off and (it is NO at Step 78) carried out like Setup mode also in Online mode (it is NO at Step 79). YES) and the imaging parameter set up now are overwritten by Current Profile at the (step 78 by turning off a power supply (Step 64).

[0053]With reference to drawing 7, the procedure (processing of the drawing 5 step 59) of Profile save operation is explained.

[0054]If the SAVE button 12 is pushed when the Setup picture shown in drawing 9 is displayed on the liquid crystal display screen 10, the Save Profile picture shown in drawing 10 will be displayed on the liquid crystal display screen 10 (Step 81). The field 121 which displays a Profile number, the field 122 which displays the name of Profile, and the SAVE instruction display field 112 are included in the Save Profile picture.

[0055]The Profile number chosen is turned on in the Profile number display field 121. According to the depression of the upper button 6 (Step 82), the Profile number on one of the Profile numbers chosen now is chosen (Step 83), According to the depression of the bottom button 7 (Step 82), the Profile number under one of the Profile numbers chosen now will be chosen (Step 83).

[0056]Since a name peculiar to Profile is displayed on the Profile name viewing area 122, Profile in which the imaging parameter suitable for an image pick-up in what kind of state is stored, and Profile in which the imaging parameter which which user uses is stored can be known. Profile of the Profile number from which the Profile name viewing area 122 serves as a blank (Blank shows drawing 10) shows that the imaging parameter is not memorized corresponding to the Profile. The Profile name viewing area 122 can make Profile of a blank Profile number memorize the set-up new imaging parameter. Of course, it cannot be overemphasized that Profile image pick-up barometer is already remembered to be may be overwritten.

[0057]A push on the SAVE button 12 will display the picture (refer to drawing 11) which inputs the name of Profile chosen on the liquid crystal display screen 10 (Step 85). (Step 84)

[0058]The field and the SAVE indication area 112 which display the Profile name inputted by the user are included in the Profile name inputted image. When the Profile name inputted image shown in drawing 11 is displayed on the liquid crystal display screen 10, the character of the alphabet is displayed on (Step 86) and an alphabetical order by pushing the upper button 6 (Step 87). The character of the alphabet is displayed on (Step 88) and reverse alphabetical order by pushing the bottom button 7 (Step 89).

[0059]The character of the alphabet currently displayed is become final and conclusive by pushing the SET button 11. By pushing the right button 9, the cursor 132 moves to right-hand side, and the character input of the following alphabet of it becomes possible. The character which constitutes the name of Profile similarly is become final and conclusive. By pushing the left button 8, the cursor 132 can move to left-hand side, and the alphabet in front of one can be changed. If all the characters are inputted, the SAVE button 11 will be pushed (it is YES at Step 90), and it will be set to Profile of the imaging parameter to which the inputted name was set (Step 91). It may be made to set up from a personal computer with a keyboard.

[0060]Drawing 8 is a flow chart which shows the procedure (processing of the drawing 5 step 61) of Profile loading operation.

[0061]If the LOAD button 13 is pushed in the Setup picture shown in drawing 9, the Load Profile picture shown in drawing 12 will be displayed on the liquid crystal display screen 10 (Step 101). The Profile number display field 141, the Profile name viewing area 142, and the LOAD instruction display field 113 are included in the Load Profile picture. The number of Profile in which the imaging parameter is stored is displayed on the Profile number display field 141 of a Load Profile picture, and the number of Profile in which the imaging parameter is not stored is not displayed on it. The name corresponding to the Profile number currently displayed on the Profile number display field 141 is displayed on the Profile name viewing area 142.

[0062]The Profile number chosen in (Step 102) and the Profile number display field 141 is changed into the number of a top or the bottom by pushing the upper button 6 or the bottom button 7 (Step 103). A push on the LOAD button 13 will load the imaging parameter stored in Profile specified by the Profile number chosen from the Profile table of the nonvolatile memory 32 (it is YES at Step 104). The image pick-up circuit 21 grade of the digital still camera 1 is set up become the loaded imaging parameter (Step 105). A photographic subject is picturized by setting up Cam mode after that. The image data showing an object image is recorded on the memory card 40 by pushing the shutter release button 2.

[0063]According to the digital still camera 1 of this example, the imaging parameter which the user set up can be made to memorize. Only by specifying a Profile number (Profile name), the same imaging parameter as the imaging parameter set up before can be set up.

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TECHNICAL FIELD

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[Background of the Invention]A user can set up image pick-up conditions (recording condition) as a digital camera has advanced features. On image pick-up conditions, for example A picture quality mode (compression ratio), image size (pixel number), Sharpness intensity, AWB (automatic white balance) mode (a standard, daytime, a fluorescent lamp, an incandescent lamp, a tungsten lamp, etc.), Varieties, such as AE (automatic exposure) modes (a standard, a night view, etc.), a color gain (chroma saturation), contrast, strobe light mode, strobe light intensity, and a zoom position, are covered. There are many kinds of image pick-up conditions which a user can set up as the digital camera of a high-class model.

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[Description of the Invention]An object of this invention is to make it end, even if it does not reset up image pick-up conditions again, when picturizing on the same image pick-up conditions as the image pick-up conditions set up before.

[0005]In the digital camera which records the image data which this invention picturized the photographic subject, was provided with the imaging means which outputs the image data showing an object image, and was outputted from the above-mentioned imaging means on a recording medium, By the image pick-up conditioning means and the above-mentioned image pick-up conditioning means of setting up image pick-up conditions. By the image pick-up condition memory measure and the above-mentioned image pick-up condition memory measure which memorize the set-up image pick-up conditions. It has the image pick-up condition selecting means which chooses image pick-up conditions from the image pick-up conditions memorized, and the imaging control means which controls the above-mentioned imaging means to picturize a photographic subject based on image pick-up conditions with the above-mentioned selected image pick-up condition selecting means.

[0006]This invention also provides the method suitable for the above-mentioned camera. Namely, in the digital camera which records the image data which this method picturized the photographic subject, was provided with the imaging means which outputs the image data showing an object image, and was outputted from the above-mentioned imaging means on a recording medium, The above-mentioned imaging means is controlled to set up image pick-up conditions, to memorize the set-up image pick-up conditions, to choose image pick-up conditions from the image pick-up conditions memorized, and to picturize

a photographic subject based on the selected image pick-up conditions.

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[0010]By inputting the name with which image pick-up conditions are expressed appropriately, by seeing the name shows the contents of the image pick-up conditions. A name is referred to and selection of image pick-up conditions becomes comparatively easy. For example, when two or more users use it, the image pick-up conditions which the user uses can be chosen only by seeing a user name by relating with the name of the user name and memorizing image pick-up conditions.

[0011]It may have further a storage control means which makes the above-mentioned image pick-up condition memory measure memorize the image pick-up conditions set as the digital camera by having been considered as power OFF by the electric power switch which turns off the power supply of a digital camera, and the above-mentioned electric power switch.

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[0013]Initial image pick-up conditions may be set as the above-mentioned image pick-up condition memory measure.

[0014]For example, image pick-up conditions can be set up only by choosing the initial image pick-up condition, without a user setting up image pick-up conditions by setting up image pick-up conditions comparatively frequently-used as initial image pick-up conditions.

[0015]

[Example]Drawing 1 is the perspective view which shows the example of this invention and looked at the digital still camera 1 from the back.

[0016]In the upper surface of the digital still camera 1, the shutter release button 2 is formed in right-hand side. The mode setting dial 3 is formed before this shutter release button 2, enabling free rotation. The arrow 4 is formed in the left-hand side of the mode setting dial 3.

[0017]The liquid crystal display screen 10 is formed in the back of the digital still camera 1 almost over the whole surface. An object image, a reproduced image, etc. which were picturized to this liquid crystal display screen 10 are displayed. If the mode set up and the mode set up are reproduction modes, the frame number and image quality (fine , Normal or economy) will be displayed on the upper part of the liquid crystal display screen 10.

[0018]The electric power switch 5 for one [a power supply] and turning off the power supply of the digital still camera 1 is formed in the upper part of the liquid crystal display screen 10.

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[0020]Drawing 2 shows the mode setting dial 3 and the arrow 4.

[0021]At the mode setting dial 3, each character of Online, Cam, Play, and Setup is indicated.

[0022]Online mode is set up by rotating the mode setting dial 3 so that the character of Online may be located in the arrow 4. Communication of the digital still camera 1 and a personal computer is attained with Online mode. Cam mode is set up by rotating the mode setting dial 3 so that the character of Cam may be located in the arrow 4. It becomes recordable [the image data which expresses an image pick-up and object image of a photographic subject with Cam mode]. By rotating the mode setting diamond 3 so that the character of Play may be located in the arrow 4, image restoration becomes possible. Setup mode is set up by rotating the mode setting dial 3 so that the character of Setup may be located in the arrow 4. An imaging parameter can be set up now with Setup mode mention later.

[0023]Drawing 3 is a block diagram showing the electric constitution of the digital still camera 1.

[0024]Operation of the whole digital still camera 1 is generalized by CPU20.

[0025]The digital still camera 1 can set up an imaging parameter mention later, and can memorize the set-up imaging parameter as a Profile table. This Profile table is memorized by the nonvolatile memory 32. The system memory 31, and the calendar/clock 33 which memorizes the operation program of the digital still camera 1 whole, etc. is contained in the digital still camera 1.

[0026]The signal which shows setting out of the various buttons (35, such as a switch) etc. which were mentioned above is inputted into the digital still camera 1 via the I/O (input/output) unit 34. The digital still camera 1 has a function of speed light photography, and the strobe control circuit 38 which controls the strobe light device 39 and the strobe light device 39 is included.

[0027]Imaging optical systems, such as solid electronic image sensors, such as CCD, a zoom lens, and a diaphragm, are included in the image pick-up circuit 21. A photographic subject will be picturized by the image pick-up circuit 21 if Cam mode is set up by the mode setting dial 4. By picturizing a photographic subject, the video signal showing an object image is outputted from the image pick-up circuit 21. In the digital disposal circuit 22, as for the video signal showing an object image, signal processing, such as white

balance adjustment, sharpness adjustment, saturation adjustment, and contrast adjustment, is performed.

[0028]The outputted video signal is changed into digital image data in the analog-to-digital conversion circuit 23 from the digital disposal circuit 22. In the digital to analog circuit 29, the changed digital image data is again returned to an analog video signal via the frame memory 27. The signal from OSD(onscreen device) 28 is also given to the digital to analog circuit 29.

[0029]By giving the video signal outputted from the digital to analog circuit 29 to the liquid crystal display 30, as shown in drawing 1, the object image which the character in the Cam mode obtained by the image pick-up piled up will be displayed on the liquid crystal display screen 10.

[0030]The connector 26 is also formed in the digital still camera 1. A personal computer is connectable with this connector 26. By giving the image data showing an object image to the connector 26 via the communication interface 25, image data will be transmitted to the personal computer connected to the connector 26.

[0031]When Cam mode is set up, in compression / extension circuit 24, the data compression of the image data outputted from the analog-to-digital conversion circuit 23 when the shutter release button 2 was pushed is carried out. The image data by which the data compression was carried out is recorded on the memory card 40 with which the memory card slot 37 is equipped via the card interface 36.

[0032]If Play mode is set up by the mode setting dial 4, the compressed image data currently recorded on the memory card 40 will be read. In compression / extension circuit 24, data extension of the read compressed image data is carried out. An object image will be displayed on the display screen 10 by giving the image data by which data extension was carried out to the liquid crystal display 30 via the frame memory 27 and the digital to analog circuit 29.

[0033]Drawing 4 is an example of the Profile table memorized by the nonvolatile memory 32.

[0034]The name is set to the Profile table for every Profile, and the imaging parameter of Profile specified by that Profile number can be read to it for every image pick-up conditions by referring to this name and specifying a Profile number. There are image quality (compression ratio), resolution, sharpness, AWB mode, AE mode, chroma saturation, contrast, a strobe mode, a stroboscope level, etc. in image pick-up conditions.

[0035]In the Profile table, the imaging parameter of the image pick-up conditions by which initial setting is carried out is also memorized. The imaging parameter by which initial setting is carried out is a parameter with high normal use frequency, and is specified in the name of DEFAULT (Profile0). The imaging parameter by which initial setting is carried out does not make a user change. The imaging parameter (Current Profile) set up when the power supply of the digital still camera 1 was turned off by the Profile table is also memorized, and if one [a power supply], the imaging parameter of Current Profile will be read.

[0036]Drawing 5 to drawing 8 is a flow chart which shows the procedure of a digital still camera. Drawing 12 shows an example of the picture displayed on the liquid crystal display screen 10 from drawing 9.

[0037]When one [with the electric power switch 5 / the power supply of the digital still camera 1], the imaging parameter of Current Profile in the Profile table memorized by

the nonvolatile memory 32 is loaded. The diaphragm value of the image pick-up circuit 21, the amount of adjustments of the white balance adjustment of the digital disposal circuit 22, the grade of sharpness, the compression ratio of compression / extension circuit 24, etc. are set up become the loaded imaging parameter (Step 51). After purchasing the digital still camera 1, in using it for the first time, There is no Current Profile in a Profile table, and by Profile0 by which initial setting is carried out. Since only the imaging parameter specified is memorized, it cannot be overemphasized that each circuit of the digital still camera 1 is set up according to the imaging parameter specified by Profile0.

[0038]The mode setting dial 3 is turned by the user and the mode is chosen (Step 52).

[0039]Setting out of Setup mode will display a Setup picture on the liquid crystal display screen 10, as shown in drawing 9 (Step 53). The imaging parameter of Current Profile is displayed on the Setup picture just behind a power turn. Each of next fields are included in the Setup picture.

[0040]Image pick-up condition viewing area 110; it is a field which displays the image pick-up conditions which can be set up by a user. There are image quality, resolution, sharpness, AWB mode, AE mode, etc. Compared with other image pick-up conditions, the light is brightly switched on so that a user may understand being chosen about the image pick-up conditions chosen among each of these photographing conditions (in drawing 12, the inverse video is carried out from drawing 9). By pushing the upper button 6 of the digital still camera 1 once, that the image pick-up conditions on one of the image pick-up conditions chosen now are chosen, a next door, and the image pick-up conditions on one light up. By pushing the bottom button 7 of the digital still camera 1 once, the image pick-up conditions under one of the image pick-up conditions chosen now will be chosen, and the image pick-up conditions under one light up.

[0041]Imaging parameter viewing area 111; according to image pick-up conditions, the imaging parameter which can be set up is displayed corresponding to image pick-up conditions. The imaging parameter set as Current Profile is displayed. The imaging parameter set up is on and the established state can be checked. By pushing the left button 8, the imaging parameter on the left-hand side of the imaging parameter chosen now will be chosen, and the imaging parameter on the right-hand side of the imaging parameter chosen now will be chosen by pushing the right button 9.

[0042]If an imaging parameter is image quality, fine (it is high-definition, and when setting up a compression ratio low, chosen), Normal (it is standard image quality, and when setting it as the usual compression ratio, chosen), or an economy (it is low image quality, and when setting up a compression ratio highly, chosen) can be set up. If it is resolution, 960 pixels of 1280 pixels of horizontal direction perpendicular directions, 768 pixels of 1024 pixels of horizontal direction perpendicular directions, or 480 pixels of 640 pixels of horizontal direction perpendicular directions can be set up. If it is sharpness, it can set up from the grade of standard sharpness to plus and the minus 1 or 2. If it is in AWB mode, a fluorescent lamp (floor line) etc. can be set up a standard (STD) and in the daytime (D/L). If it is in AE mode, there are a standard (STD), an object for night views (Slow sync), etc. If it is contrast, it can set up from the grade of standard contrast to plus and the minus 1 or 2.

[0043]SAVE instruction viewing area 112; if the set-up imaging parameter may be sufficient, the character to which the depression of the SAVE button 12 is urged is

displayed.

[0044]LOAD instruction viewing area 113; when an imaging parameter is loaded so that it may mention later, the character to which the depression of the LOAD button 13 is urged is displayed.

[0045]If the upper button 6 or the bottom button 7 is pushed as mentioned above (it is YES at Step 54), the image pick-up conditions chosen according to the depression will change (Step 55). A push on the left button 8 or the right button 9 will change the imaging parameter chosen according to the depression (Step 57). (it is YES at Step 56)

[0046]As mentioned above, when the SAVE button 12 is pushed (Step 58), the set-up imaging parameter is saved to a Profile table as new Profile (Step 59). (Profile save operation) This Profile save operation is mentioned later in detail. As mentioned above, when the LOAD button 13 is pushed (Step 60), the imaging parameter of selected Profile is loaded from a Profile table (Step 61). (Profile loading operation) This Profile loading operation is also mentioned later in detail.

[0047]If the power supply of the digital still camera 1 is not turned off by the electric power switch 5 (it is NO at Step 62), unless the mode is changed by the mode setting dial 3, processing of Steps 53-61 is repeated (Step 63).

[0048]If the power supply of the digital still camera 1 is turned off by the electric power switch 5 (it is YES at Step 62), the imaging parameter of the actual condition set up will be overwritten by Current Profile (Step 64). Next, when one [the power supply of the digital still camera 1], it is automatically set as the state of the imaging parameter set up at the end.

[0049]If the mode in which the set-up mode was changed or (it is YES at Step 63) set up is except Setup mode (Step 52), it will become processing in the mode changed or set up.

[0050]Setting out of Cam mode will perform imaging operation of a photographic subject (Step 71). A power supply is not turned off like Setup mode (it is NO at Step 72), and imaging operation is continued unless a mode change is carried out (it is NO at Step 73). YES) and the imaging parameter set up now are overwritten by Current Profile at the (step 72 by turning off a power supply (Step 64).

[0051]Setting out of Play mode will perform reproduction motion of the image data currently recorded on the memory card 40 with which the digital still camera 1 is loaded (Step 74). Imaging operation is continued unless the mode change of the power supply is turned off and (it is NO at Step 75) carried out like Setup mode also in Play mode (it is NO at Step 76). YES) and the imaging parameter set up now are overwritten by Current Profile at the (step 75 by turning off a power supply (Step 64).

[0052]Setting out of Online mode will perform connecting operation with the personal computer connected to the connector 26 of the digital still camera 1 (Step 77). Imaging operation is continued unless the mode change of the power supply is turned off and (it is NO at Step 78) carried out like Setup mode also in Online mode (it is NO at Step 79). YES) and the imaging parameter set up now are overwritten by Current Profile at the (step 78 by turning off a power supply (Step 64).

[0053]With reference to drawing 7, the procedure (processing of the drawing 5 step 59) of Profile save operation is explained.

[0054]If the SAVE button 12 is pushed when the Setup picture shown in drawing 9 is displayed on the liquid crystal display screen 10, the Save Profile picture shown in drawing 10 will be displayed on the liquid crystal display screen 10 (Step 81). The field

121 which displays a Profile number, the field 122 which displays the name of Profile, and the SAVE instruction display field 112 are included in the Save Profile picture.

[0055]The Profile number chosen is turned on in the Profile number display field 121. According to the depression of the upper button 6 (Step 82), the Profile number on one of the Profile numbers chosen now is chosen (Step 83), According to the depression of the bottom button 7 (Step 82), the Profile number under one of the Profile numbers chosen now will be chosen (Step 83).

[0056]Since a name peculiar to Profile is displayed on the Profile name viewing area 122, Profile in which the imaging parameter suitable for an image pick-up in what kind of state is stored, and Profile in which the imaging parameter which which user uses is stored can be known. Profile of the Profile number from which the Profile name viewing area 122 serves as a blank (Blank shows drawing 10) shows that the imaging parameter is not memorized corresponding to the Profile. The Profile name viewing area 122 can make Profile of a blank Profile number memorize the set-up new imaging parameter. Of course, it cannot be overemphasized that Profile image pick-up barometer is already remembered to be may be overwritten.

[0057]A push on the SAVE button 12 will display the picture (refer to drawing 11) which inputs the name of Profile chosen on the liquid crystal display screen 10 (Step 85). (Step 84)

[0058]The field and the SAVE indication area 112 which display the Profile name inputted by the user are included in the Profile name inputted image. When the Profile name inputted image shown in drawing 11 is displayed on the liquid crystal display screen 10, the character of the alphabet is displayed on (Step 86) and an alphabetical order by pushing the upper button 6 (Step 87). The character of the alphabet is displayed on (Step 88) and reverse alphabetical order by pushing the bottom button 7 (Step 89).

[0059]The character of the alphabet currently displayed is become final and conclusive by pushing the SET button 11. By pushing the right button 9, the cursor 132 moves to right-hand side, and the character input of the following alphabet of it becomes possible. The character which constitutes the name of Profile similarly is become final and conclusive. By pushing the left button 8, the cursor 132 can move to left-hand side, and the alphabet in front of one can be changed. If all the characters are inputted, the SAVE button 11 will be pushed (it is YES at Step 90), and it will be set to Profile of the imaging parameter to which the inputted name was set (Step 91). It may be made to set up from a personal computer with a keyboard.

[0060]Drawing 8 is a flow chart which shows the procedure (processing of the drawing 5 step 61) of Profile loading operation.

[0061]If the LOAD button 13 is pushed in the Setup picture shown in drawing 9, the Load Profile picture shown in drawing 12 will be displayed on the liquid crystal display screen 10 (Step 101). The Profile number display field 141, the Profile name viewing area 142, and the LOAD instruction display field 113 are included in the Load Profile picture. The number of Profile in which the imaging parameter is stored is displayed on the Profile number display field 141 of a Load Profile picture, and the number of Profile in which the imaging parameter is not stored is not displayed on it. The name corresponding to the Profile number currently displayed on the Profile number display field 141 is displayed on the Profile name viewing area 142.

[0062]The Profile number chosen in (Step 102) and the Profile number display field 141

is changed into the number of a top or the bottom by pushing the upper button 6 or the bottom button 7 (Step 103). A push on the LOAD button 13 will load the imaging parameter stored in Profile specified by the Profile number chosen from the Profile table of the nonvolatile memory 32 (it is YES at Step 104). The image pick-up circuit 21 grade of the digital still camera 1 is set up become the loaded imaging parameter (Step 105). A photographic subject is picturized by setting up Cam mode after that. The image data showing an object image is recorded on the memory card 40 by pushing the shutter release button 2.

[0063]According to the digital still camera 1 of this example, the imaging parameter which the user set up can be made to memorize. Only by specifying a Profile number (Profile name), the same imaging parameter as the imaging parameter set up before can be set up.

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is the perspective view which looked at the digital still camera from the back.

[Drawing 2]The mode setting dial is shown.

[Drawing 3]It is a block diagram showing the electric constitution of a digital still camera.

[Drawing 4]The Profile table is shown.

[Drawing 5]It is a flow chart which shows the procedure of a digital still camera.

[Drawing 6]It is a flow chart which shows the procedure of a digital still camera.

[Drawing 7]It is a flow chart which shows Profile save operation.

[Drawing 8]It is a flow chart which shows Profile loading operation.

[Drawing 9]It is an example of the picture displayed on the liquid crystal display screen of a digital still camera.

[Drawing 10]It is an example of the picture displayed on the liquid crystal display screen of a digital still camera.

[Drawing 11]It is an example of the picture displayed on the liquid crystal display screen of a digital still camera.

[Drawing 12]It is an example of the picture displayed on the liquid crystal display screen of a digital still camera.

[Description of Notations]

1 Digital still camera

3 Mode setting dial
5 Electric power switch
6 Upper button
7 Bottom button
8 Left button
9 Right button
10 Liquid crystal display screen
12 The SAVE button
13 The LOAD button
20 CPU
21 Image pick-up circuit
22 Digital disposal circuit
24 Compression/extension circuit
30 Liquid crystal display
32 Nonvolatile memory
40 Memory card

[Translation done.]

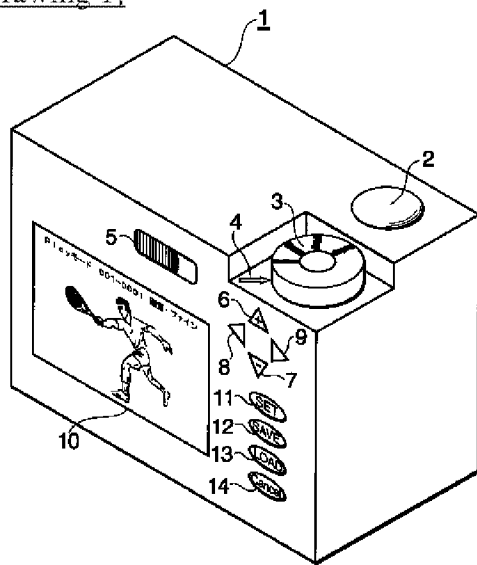
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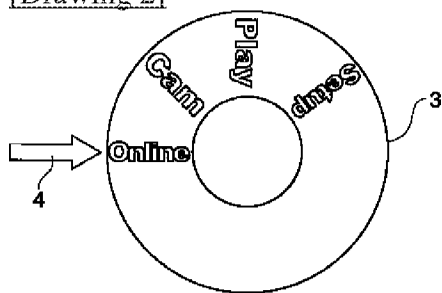
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
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DRAWINGS

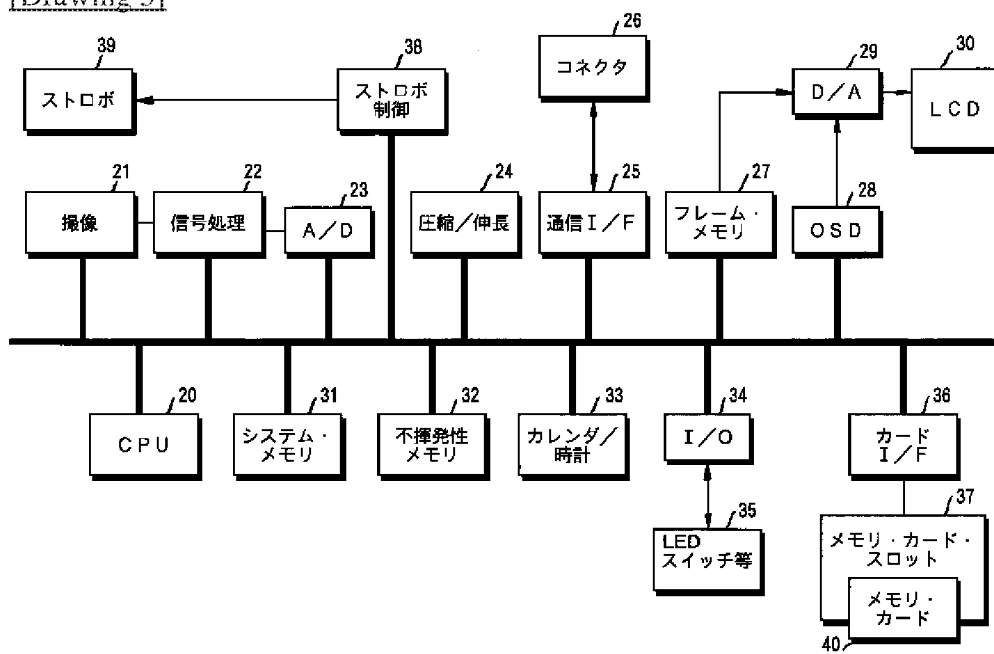
[Drawing 1]



[Drawing 2]



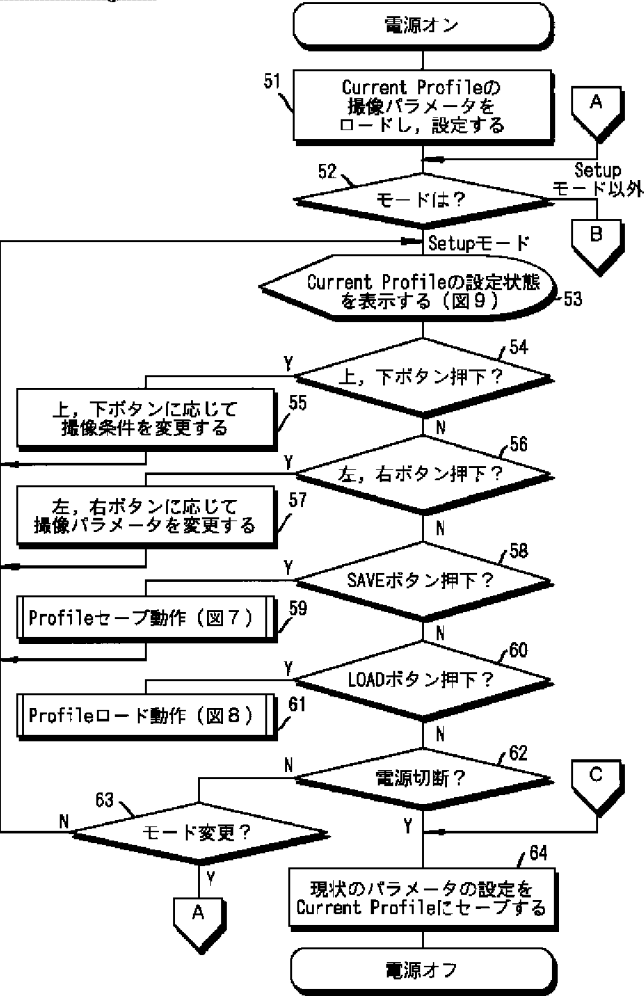
[Drawing 3]



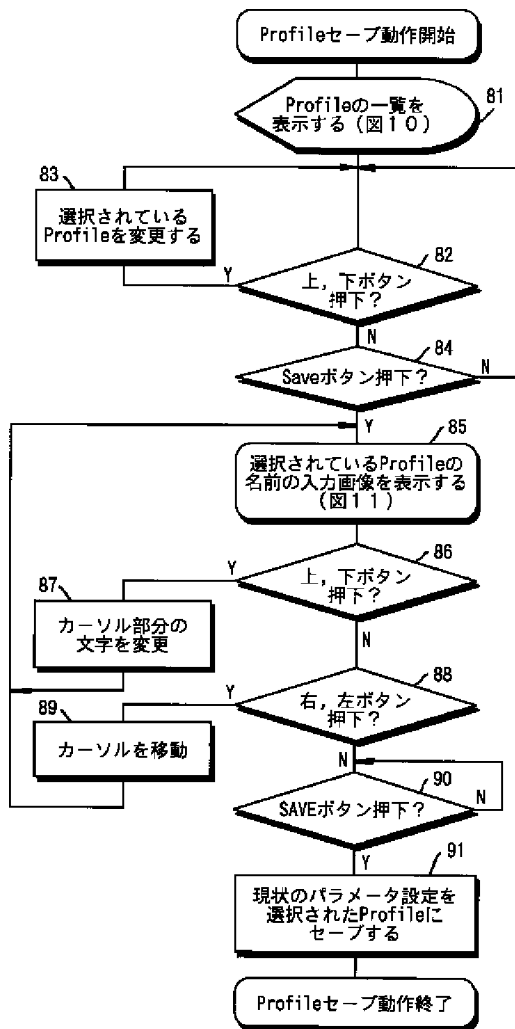
[Drawing 4]

Profile 番号	Profile0 (初期設定)	Profile1	Profile2	Profile3	Profile4	Profile5	...	Profile8	Current Profile
撮像条件									
名前	"DEFAULT"	NULL	"PAPA"	"PAPA NIGHTVIEW"	NULL	"MAMA"	...	"WWW"	-
画質	ノーマル	-	ファイン	ファイン	-	ノーマル	...	エコノミー	ファイン
解像度	1280×960	-	1024×768	1024×768	-	1280×960	...	640×480	1280×960
シャープネス	±0	-	+1	-1	-	+2	...	+1	+3
AWB モード	オート	-	日中	オート	-	オート	...	オート	蛍光灯
AE モード	標準	-	標準	夜景用	-	標準	...	標準	夜景用
彩度	±0	-	+1	±0	-	+2	...	+1	-1
コントラスト	±0	-	+1	±0	-	+2	...	+1	-1
ストロボ・モード	オート	-	オフ	オート	-	オート	...	オート	オン
ストロボ・レベル	±0	-	+1	+0.3	-	±0	...	±0	+0.6

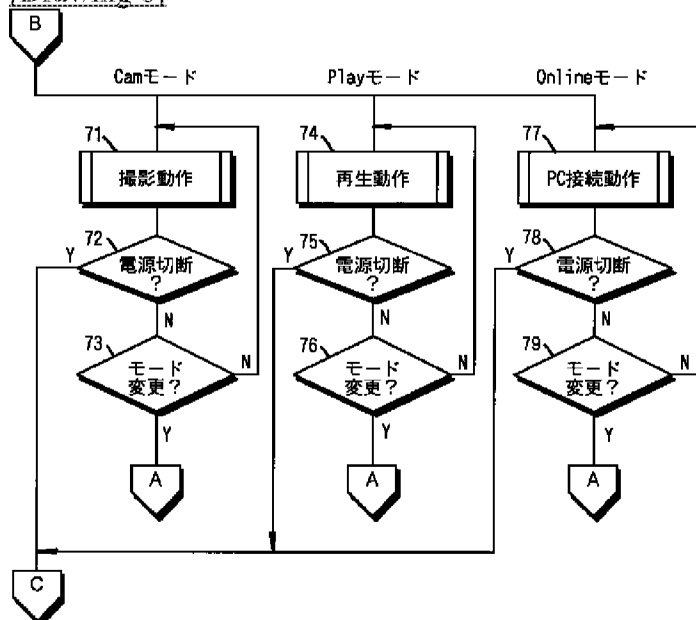
[Drawing 5]



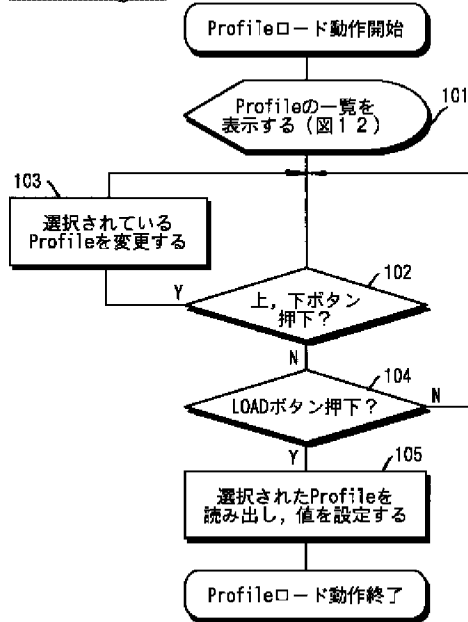
[Drawing 7]



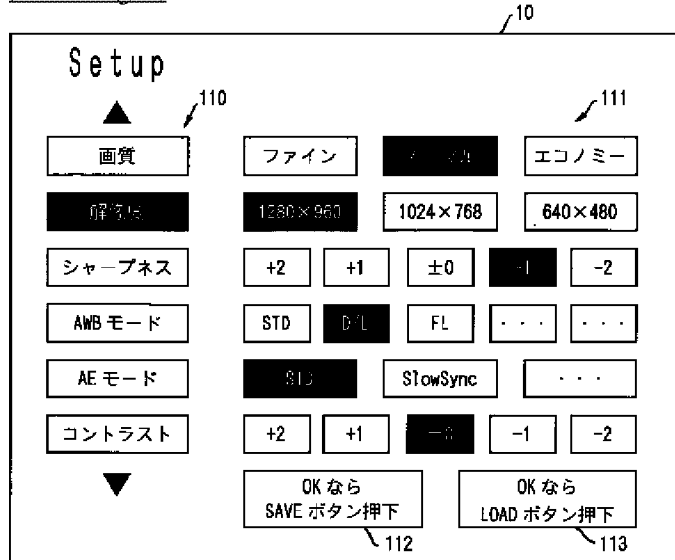
[Drawing 6]



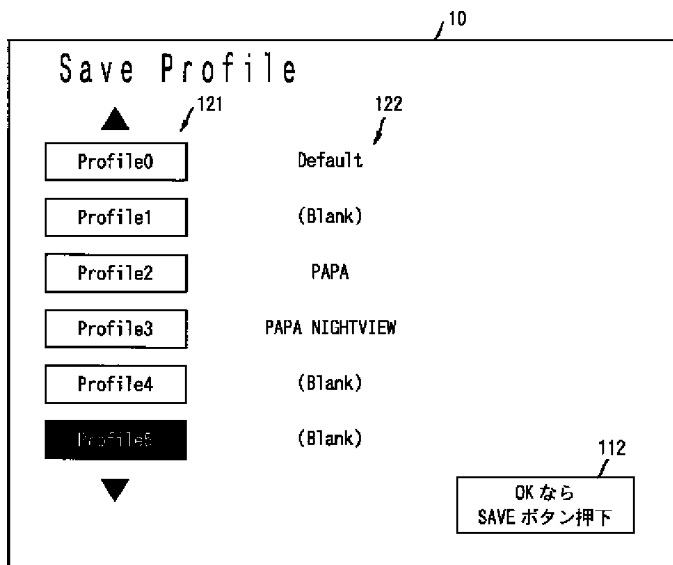
[Drawing 8]



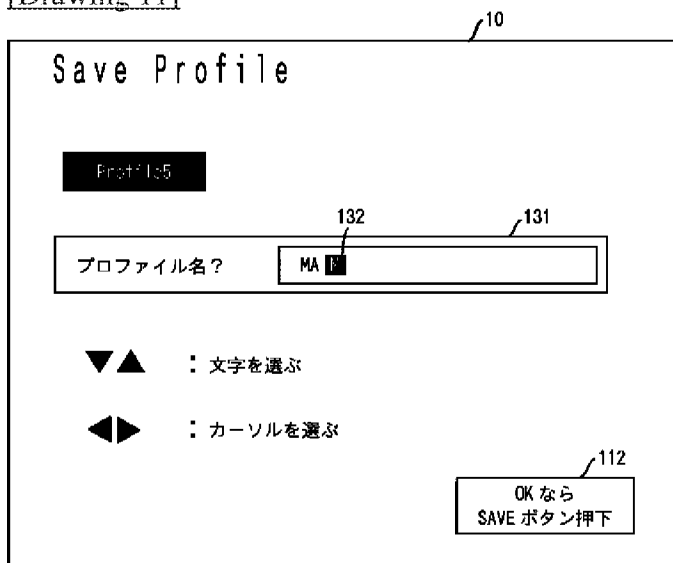
[Drawing 9]



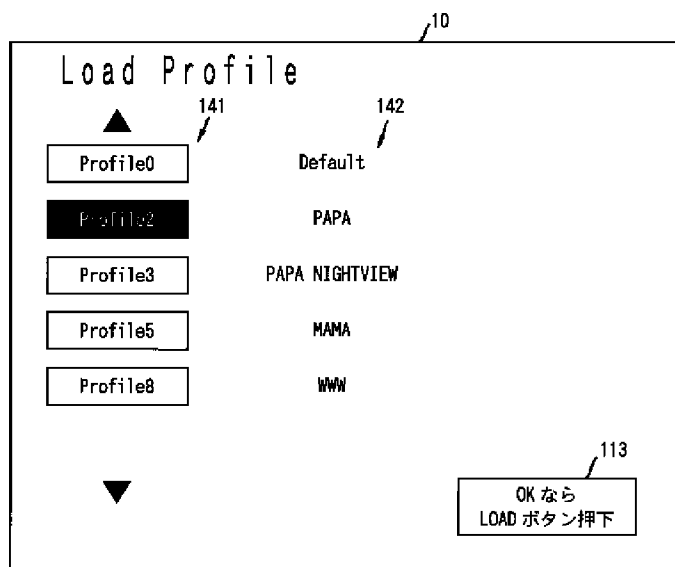
[Drawing 10]



[Drawing 11]



[Drawing 12]



[Translation done.]